

REMARKS

I. Introduction

In response to the pending Office Action, Applicants respectfully submit that all pending claims are patentable over the cited prior art for at least the following reasons.

II. Patentability of Claims 1, 3-7, 9 and 11-15 Under 35 U.S.C. § 102 or 103

Claims 1, 4, 6, 9 and 12 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Watson et al. ("Synthesis of a novel magnetic photocatalyst by direct deposition of nanosized TiO₂ crystals onto a magnetic core). Claims 3, 5, 11 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Watson; and claims 7, 14 and 15 as being unpatentable over Watson in view of Ueta et al. (US 2004/0126609). Applicants respectfully traverse these rejections for at least the following reasons.

Independent claims 1 and 9 each recite, in part, a soft magnetic material comprising a lower film surrounding a surface of said metal magnetic particle and being formed of an oxide of a nonferrous metal satisfying a composition range where oxygen is less than oxygen of a stoichiometry composition of a compound constituted of an element and oxygen, that constitute the lower film, and an insulating upper film surrounding a surface of said lower film and including oxygen. The nonferrous metal includes at least one amorphous metal selected from the group consisting of aluminum, chromium, and silicon.

One feature of the present claims is that the soft magnetic material comprising a lower film surrounding a surface of the metal magnetic particle and being formed of an oxide of a nonferrous metal satisfies a composition range where oxygen is less than oxygen of a stoichiometry composition of a compound constituted of an element and oxygen, that constitute

the lower film, and an insulating upper film surrounding a surface of said lower film and including oxygen.

In the Response to Arguments section of the Office Action, the Examiner asserts that Watson discloses silica dioxide coated magnetic particles that are prepared by the sol-gel process similar to Applicant's disclosure. As such, the Examiner concludes that it would have been obvious to use silica dioxide amorphous metal to encapsulate the magnetic particle. Applicants respectfully disagree.

Although Watson teaches a SiO_2 film formed from an amorphous metal, this film is not formed of an oxide of a nonferrous metal within the claimed composition range where oxygen is less than oxygen of a stoichiometry composition. This is because in the SiO_2 film of Watson, the Si has a valence of 4 and each O has a valence of 2, so the SiO_2 satisfies a material in which the oxygen is equal to an oxygen of a stoichiometry composition of a compound constituted of an element and oxygen, i.e., $4 = 2 + 2$.

The Examiner alleges that the lower film of claims 1 and 9 and the SiO_2 of Watson are formed via the same manufacturing method (i.e., the sol-gel method). As is well known in the art, the sol-gel method is generally used to manufacture ceramics. For example, the sol-gel method is used to make alumina (Al_2O_3), which also satisfies an oxygen that is equal to an oxygen of a stoichiometry composition of a compound constituted of an element and oxygen ($2 \text{ Al} \times 3 = 6, 3 \text{ O} \times 2 = 6; 6 = 6$).

In contrast, beginning at page 15, line 12 of the specification, the present disclosure teaches a sol-gel method for manufacturing an oxide having less oxygen of a stoichiometry composition. Thus, the mere fact that a sol-gel method is disclosed does not necessarily mean

that a composition range where oxygen is less than oxygen of a stoichiometry composition is formed. Rather, the determination of whether an oxide meets the claimed oxygen limitation depends on the composition of the alkoxide used for the sol-gel method. The lower film of the present disclosure is formed of an oxide of a nonferrous metal that satisfies the claimed composition range where oxygen is less than oxygen of a stoichiometric composition. In this method, a solution is prepared using a material such as methyltrimethoxysilane ($\text{CH}_3\text{Si}(\text{OCH}_3)_3$) in which one or more of 4 bonds of Si is replaced with an organic group ($\text{C}_n\text{H}_{2n+1}$) and bonds of Si and O are limited to three or less, instead of tetraethoxysilane $\text{Si}(\text{OC}_2\text{H}_5)_4$, which is usually used for the synthesis of SiO_2 . The lower film produced has less oxygen than a stoichiometric amount of oxygen. As a result, oxygen diffusing from the upper film toward metal magnetic particles can be readily captured in the lower film, because a smaller number of oxygen bonds provides the above-described effect of capturing oxygen more effectively, and therefore, dimethoxysilane with two oxygen ligands is more preferable than trimethoxysilane. In addition, one bond of Si may be left by a hydrate ion state (such as silicate ions).

In contrast, as shown previously, Watson teaches a TiO_2 powder that has Ti (4) and 2 O (2×2), such that $4 = 4$. As such, the TiO_2 powder disclosed in Watson does not satisfy a composition range where oxygen is less than oxygen of a stoichiometry composition of a compound constituted of an element and oxygen. Further, Watson is completely silent with respect to a claimed range of oxygen less than oxygen in a stoichiometric amount.

Furthermore, the amorphous oxide of Watson has a basic structure where the distance between lattice points of an oxide crystal is random. This is not to be confused with the amorphous metal of claims 1 and 9, where the basic crystal structure of the oxide is one in which

metal atoms are partially replaced with oxygen. The metal atoms have at least one bond with a metal crystal without oxygen therebetween.

Anticipation under 35 U.S.C. § 102 requires that each element of the claim in issue be found, either expressly described or under principles of inherency, in a single prior art reference, *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983). At a minimum, Watson fails to disclose the limitations of independent claims 1 and 9 for the reasons set forth above. Accordingly, claims 1 and 9 are allowable and patentable over the cited prior art. Reconsideration and withdrawal of the rejection of claims 1 and 9 is respectfully solicited.

III. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims. *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claims 1 and 9 are patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

IV. Conclusion

Having responded to all open issues set forth in the Office Action, it is respectfully submitted that all claims are in condition for allowance.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

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including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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